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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/529,261

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Daihachi Shojima

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EXAMINER

PICKARD, ALISON K

ART UNIT

PAPER NUMBER

3676

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/529,261	<b>Applicant(s)</b> SHOJIMA, DAIHACHI	
	<b>Examiner</b> Alison K. Pickard	<b>Art Unit</b> 3676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 5,6,13 and 14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5,6,13 and 14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (Fig. 7 and spec. pages 1-3) in view of Tanaka in view of Rice (5,722,668).

In figure 7, for example, Applicant discloses a known apparatus for manufacturing a semiconductor device having a packing groove with a seal 51. The o-ring 51 is made from plasma resistant FKM (or FFKM). And Applicant discloses that PTFE is a known material having plasma resistance. However, Applicant does not disclose the plasma seal as required by the claims. Tanaka teaches a plasma resistance seal having improved characteristics due to a laminated structure of a packing material 1 protected by a plasma resistant material 2. Tanaka teaches various cross-sections that provide the benefits of the two materials. Figure 5a or 7a, for example, teach a shape wherein the packing is an o-ring and is covered by an arch shaped plasma seal. As seen in either figure, the diameter of the packing is larger than a width of the plasma seal (i.e. width taken from portion touching element 1 to the outer side of 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of the prior art by using a dual-material structure as taught by Tanaka to provide combined desirable properties of two materials and maintain an effective seal.

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Rice teaches a plasma resistant seal having a PTFE cover and rubber packing. Rice teaches that fillers should not be used because they can become contaminants in the chamber. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the materials such that no fillers are used to prevent contamination in the chamber.

Also, Applicant's Figure 7 appears to show the groove as having a wall at a right angle to the end surface, but Applicant does not appear to specifically state this. Regardless, it is not considered inventive to discover the optimum or workable ranges by routine experimentation absent some showing of criticality. See *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the sidewall perpendicular to the end surface of the groove.

OR, considered another way, Rice teaches using a PTFE seal 64 to protect a packing 68. Rice teaches the seal 64 have different configurations (see col. 6, lines 25-28). And Tanaka teaches equivalent configurations for dual material seals used in such environments. it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the packing of the APA with a PTFE seal as taught by Rice to protect the seal and with one of the shapes taught by Tanaka as such are equivalent configurations and would yield expected results.

3. Claims 5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's APA Figure 7 in view of Winters in view of Havens (4,039,741) in view of Rice.

In figure 7, for example, Applicant discloses a known apparatus for manufacturing a semiconductor device having a packing groove with a seal 51. The o-ring 51 is made from

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plasma resistant FKM (or FFKM). Figure 7 appears to show the groove as having a wall at a right angle to the end surface, but Applicant does not appear to specifically state this. Regardless, it is not considered inventive to discover the optimum or workable ranges by routine experimentation absent some showing of criticality. See *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the sidewall perpendicular to the end surface of the groove.

However, Applicant does not disclose the plasma seal and additional groove as required by the claims.

Winters teaches an apparatus for making semiconductor devices having a plasma resistant seal (blocking member 232) in a groove that is shallower than a groove holding packing ring 230. Winters discloses that the blocking element is more plasma resistant than the main seal 230 (col. 7, lines 47-49) and protects the main seal. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of the prior art with a second, shallower groove holding a plasma seal to protect the main seal as taught by Winters. Also, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a groove shaped with the perpendicular walls in the APA as such is a known, equivalent shape and would yield expected results.

Winters teaches that PTFE is a suitable material for the member (col. 7, lines 61-66). Winters discloses that the blocking member can be different shapes (col. 7, lines 44-45). And, Winters discloses an example of "preferred" shape that comprising a core (which offers some resilience) and jacket (which provides the required plasma resistance). Winters, therefore, is not considered to be limited to this shape. However, Winters does not appear to disclose an alternate

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shape such as the arch cross-section required by the claims. Havens teaches forming a seal with a curved/arched cross-section (concave of arch faces groove) to prevent the modulus of elasticity of the material from being exceeded upon compression (i.e. it provides some resiliency). This extends the life and use of the seal. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the shape of seal 232 to have an arch shape to improve the life of the seal. The combination would result in an arch shaped seal comprised of PTFE.

Rice teaches a plasma resistant seal having a PTFE cover and rubber packing. Rice teaches that fillers should not be used because they can become contaminants in the chamber. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the materials such that no fillers are used to prevent contamination in the chamber.

### ***Response to Arguments***

4. Applicant's arguments filed 11-6-09 have been fully considered but they are not persuasive.

Applicant argues that Tanaka does not disclose the diameter of the packing being larger than the width of the plasma seal. The examiner disagrees. The claims do not define the measurements in a way that prevents Tanaka from being interpreted as described above.

Applicant argues that Tanaka does not disclose PTFE. This is unpersuasive. Both APA and Rice disclose a PTFE seal is known to provide plasma resistance. Tanaka is being used for its teaching of equivalent configurations for multi-material seals.

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Applicant argues that Winters does not disclose the PTFE seal serves as a back-up ring. The examiner disagrees. The ring is more rigid than the rubber seal and would inherently function as an anti-extrusion ring for the other seal. The examiner also notes that the claims do not require the two rings to be in contact as argued. The combination yields all the claimed structure and is therefore considered to function as required as well.

Applicant argues criticality for the perpendicular sidewalls, however has not noted where this is stated in the specification. Regardless, it appears that the prior art groove wall is at a right angle. And, at the very least, it is considered close enough to be considered obvious to make it a right angle. See *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alison K. Pickard whose telephone number is 571-272-7062. The examiner can normally be reached on M-F (9-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Will can be reached on 571-272-6998. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alison K. Pickard/  
Primary Examiner, Art Unit 3676

AP